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REDISCOVERY OF THE PRESUMED EXTINCT TRIGGERPLANT *STYLIDIUM MERRALLII* (STYLIDIACEAE) WITH AN AMENDED DESCRIPTION OF THE SPECIES AND ITS CONSERVATION STATUS.

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ABSTRACT

Kenneally, Kevin F. and Lowrie, Allen Rediscovery of the presumed extinct triggerplant *Stylidium merrallii* (F. Muell.) T. Durand and B.D. Jackson, (Stylidiaceae) with an amended description of the species and its conservation status. *Stylidium merrallii*, previously gazetted as "presumed to be extinct", has been recollected and its description amended and conservation status changed to "Taxa known to be extant".

INTRODUCTION

Stylidium merrallii was described by Ferdinand von Mueller from fragmentary material collected by Edwin Merrill in 1888 from near Lake Brown (not to be confused with the farming district of the same name in the near vicinity), which is 160 kilometres (= 100 miles) north east of Toodyay. Little is known of the collector Edwin Merrill (1844–1913) except that he collected extensively in the East Gippsland area of Victoria and later moved to Western Australia, where he was described as a prospector and miner (Hall 1984). He died in the Government Hospital, Coolgardie, Western Australia, on 29 January 1913. His death certificate recorded his occupation as 'prospector'.

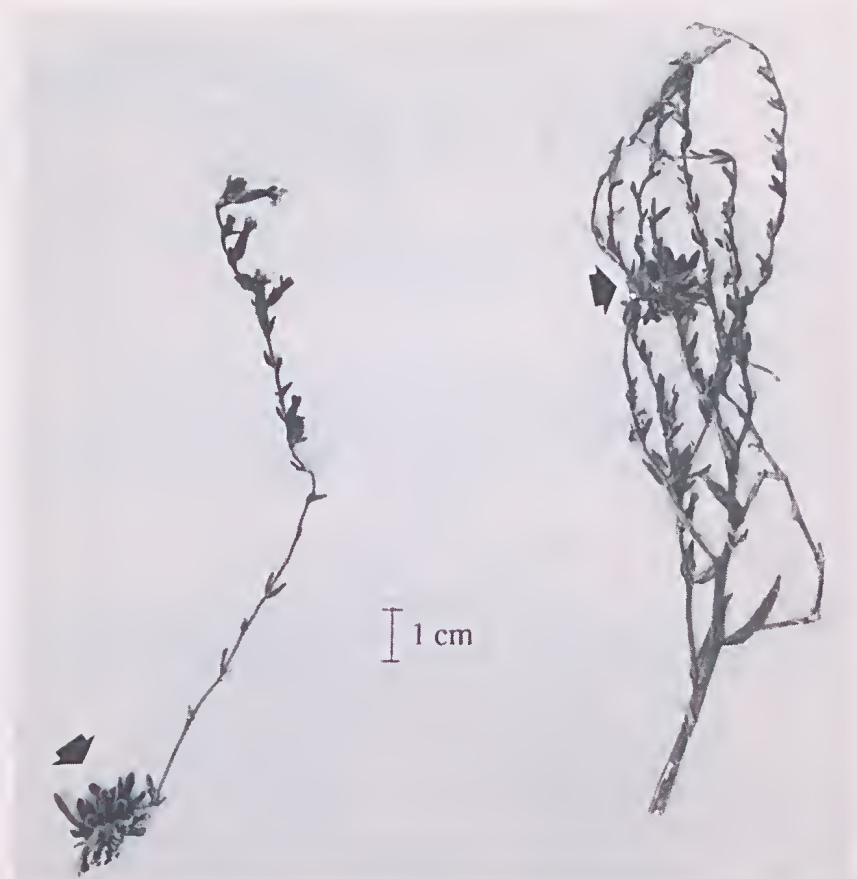


Figure 1. Type sheet of *Stylidium merrallii* F. Muell. (adventitious rosettes arrowed). (MEL 50294).

The type material of *S. merrallii* housed in the National Herbarium of Victoria (MEL) consists of two fragments of the upper part of an inflorescence (Figure 1).

Mildbraed (1908) in his monograph of Stylidiaceae placed *S. merrallii* in subgenus *Nitangium* (Endl.) Mildbr. sect. *Thyrsiformes* (Benth.) Mildbr.

The inadequacy of the type material and the uncertainty of its collecting locality have contributed to this species not being recollected for over 100 years. Rica Erickson (1958) in her seminal work on triggerplants noted: "This plant has been collected only once, and it is possible that later clearing for farmlands has destroyed its habitat". *Stylidium merrallii* was listed under "Taxa Presumed to be Extinct" in the *Wildlife Conservation (Rare Flora) Notice* on page 2953 of the July 1992 Western Australian Government Gazette and illustrated from the type sheet in Hopper *et al.* (1990).

In 1976, Basil and Mary Smith of Wongan Hills collected an inflorescence of an unidentified *Stylidium* species from Walyahmoning Rock, 40 kilometres south east of Bonnie Rock in the eastern wheatbelt, which they forwarded to the Western Australian Herbarium (PERTH). In 1991, one of us (A.L.) discovered the specimen in the Herbarium and suspecting that it may be referable to *S. merrallii* contacted the Smiths and requested more details. At the first opportunity Basil Smith conducted an aerial survey of the collecting locality in his Cessna 150 aircraft, reporting on his return that the area was extremely dry and no material was likely to be collected until the next season. He subsequently provided maps, detailing collecting localities on Walyahmoning Rock.

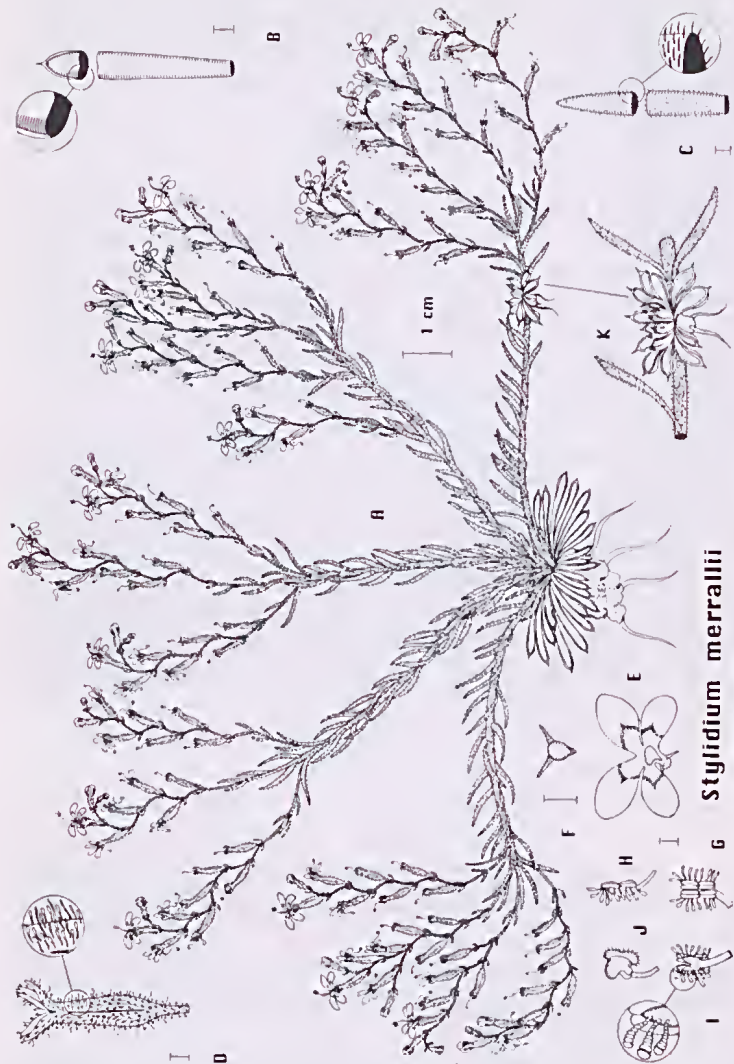
In early 1992, Dr S. James of the Botany Department, University of Western Australia was conducting field work on *Isotoma petraea* at Yanneymooning Hill, 20 kms south west of Walyahmoning Rock. Here he collected living material, consisting of basal rosettes of an unidentified triggerplant. Some of this material was given to Allen Lowrie who examined the rosettes and found evidence of old flowering axes amongst the leaves similar to those found on *Stylidium merrallii*.

On 10 October 1992, Allen Lowrie visited Yanneymooning Hill and collected further non-flowering material for cultivation. On 18 November of that year, Dr S. James and Allen Lowrie again revisited Yanneymooning Hill and collected early flowering specimens and buds for cytological study. On 24 February 1993, Allen Lowrie, Daphne Edinger and Kevin Kennelly returned to Yanneymooning Hill and found *S. merrallii* still flowering and fruiting. Examination of the population revealed the development along the major axes of adventitious propagules. These formed rosettes, bearing adventitious roots, similar to those found on the type fragments.

TAXONOMY

Stylidium merrallii (F. Muell.) T. Durand and B.D. Jackson, Index Kew. Suppl. 1:77(1896) (as '*S. Morallii*'); Pritzel, Bot. Jahrb. 35:596 (1904). – *Candollea merrallii* F. Muell., *Victorian Naturalist* 5:76 (1888). *Type citation*: 'Near Lake Brown: Edwin Merrall.' *Holotype*: 100 miles [160 km] East of Newcastle [= Toodyay], W.A., West of Lake Brown, 1888, E. Merrall. (MEL 50294).

Rhizomatous, densely rosetted perennial (the leaves of the basal rosette often becoming tufted or caducous with age). *Major axes* several, erect or spreading, slender, up to 18 cm long, leaves scattered (with adventitious rosettes developing in their axils late in the flowering period), the upper leaves subtending numerous compound racemes. *Leaves of basal rosettes* crowded, firm and flat, up to 1.5 cm long, glabrous, slightly spatulate at apex, margin thickly



Styliidium merrallii
A. Lowrie 1993

Figure 2. *Styliidium merrallii*. A – flowering plant (scale bar = 1 cm); B – basal rosette leaf; C – leaves of major axes; D – hypanthium showing indumentum of glandular hairs; E – flower; F – labelium; G – column front view; H – column lateral view; I – column lateral view with enlargement showing the clavate, moniliform translucent hairs; J – column lateral view with stigma grown out; K – adventitious rosette produced on the major axes. All other scale bars = 1 mm. From Lowrie 702 (PERTH).

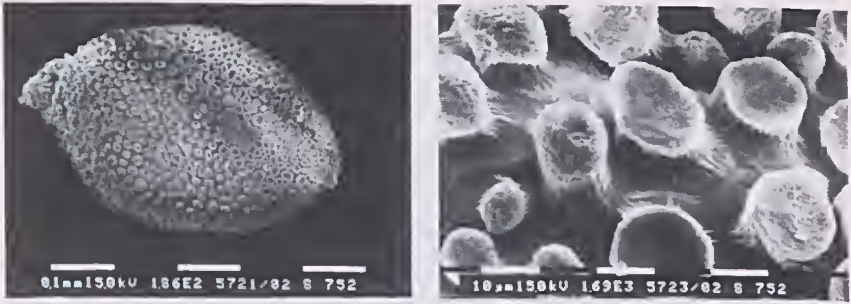


Figure 3. SEM photographs of a seed of *S. merrallii* showing blunt papillae. From Kenneally 11356 (PERTH).

white-scarious, mucronate, minutely denticulate. *Leaves of major axes* spreading and scattered, very narrowly oblong, up to 2 cm long, without white margin, long-pilose. *Leaves of adventitious rosettes* spatulate to narrowly oblong, margin thickly white-scarious, prominently mucronate. *Floral leaves* or bracts numerous, arranged in pairs along the whole length of the scape, sessile, much smaller than major axes leaves, densely pilose. *Inflorescence* of numerous, filiform, compound racemes. *Hypanthium* shortly pilose and minutely glandular-puberulous, tube c. 6 mm long, almost oblong. *Sepals* 5, free to base, c. 1.5 mm long, blunt. *Corolla* pink (rarely white), with dark rose markings near the throat, lobes laterally paired, anterior lobes c. 3 mm long, posterior lobes c. 4 mm long, throat



Figure 4. Yanneymooring Hill showing the apron surrounding the granite outcrop dominated by an open shrubland of *Calycoplepus ephedroides* and *Acacia tetragonophylla*.



Figure 5. Daphne Edinger and Allen Lowrie examining a population of *S. merrallii* at Yanneymooning Hill.

appendages absent; labellum ovate with a minute point and two lateral appendages. *Capsule* narrowly oblong, compressed sideways, dumbbell-shaped in cross-section, up to 60 mm long, wider at the base. *Seeds* ovoid, up to 0.5 mm long, papillate, brown (Figures 2 and 3).

Other specimens examined. (WESTERN AUSTRALIA): K.F. Kenneally 11356, 24 February 1993 (CANB, K, MEL, NSW, PERTH); Yanneymooning Hill, 40 km NE of Muckinbudin (30°43'S 118°34'E), Allen Lowrie 680, 10 October 1992 (PERTH); 702, 18 November 1992 (BRI, CANB, K, L, MEL, NSW, PERTH); 704, 24 February 1993 (PERTH); Wahlyamoning [Walyahmoning] Rock, B. & M. Smith s.n., 8 October 1976 (PERTH).

Distribution. Avon District, Southwest Botanical Province (Beard 1980). Restricted to drainage channels and seasonally inundated flats on the aprons of granite rock outcrops in the eastern wheatbelt of Western Australia.

Ecology. In grey clay supporting an open shrubland of *Calycopsephus ephedroides* Planchon and *Acacia tetragonophylla* F. Muell. at Yanneymooning Hill. In coarse granite silt with stunted *Allocasuarina huegeliana* (Miq.) L. Johnson with some *Acacia* and *Melaleuca* at Walyahmoning Rock (Figures 4 and 5).

Flowering period. October–February, but dependent on available soil moisture. Specimens in cultivation have continued to flower into May.



Figure 6. Close-up of part of the major axes of *Styloidium merrallii* showing adventitious rosettes (arrowed). From Kenneally 11356 (PERTH).

Conservation status: CALM Conservation Codes for Western Australian Flora: amended from X: Declared Rare Flora – Presumed Extinct Taxa to R: Declared Rare Flora – Extant Taxa.

Chromosome number. $n = 15$.

DISCUSSION

It can now be established that the type material collected by Merrall represented only part of the the upper flowering axes of *S. merrallii*, bearing adventitious, rosetted propagules. The position of one of the adventitious rosettes on part of the type material falsely conveyed the impression that this was a creeping triggerplant and thus resulted in confusing its identity. Because the type material bears these adventitious rosettes (Figure 1) we can speculate that Merrall may have collected the plant specimens in late January or February when these propagules are initiated (Figure 6).

Examination of the population at Yanneymooning Hill has

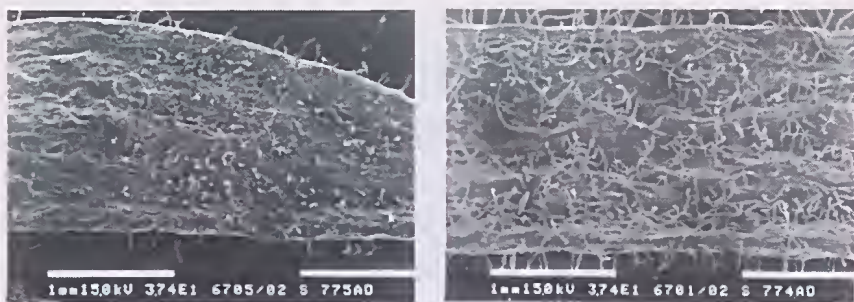


Figure 7. SEM of major axes of leaf fragments of the type (MEL 50294), left and Kenneally 11356 (PERTH), right, showing the similarity in indumentum on the adaxial surfaces.

confirmed that where the major axes make contact with the ground, the adventitious rosettes take root and new plants develop. This results in young rosettes forming in a discontinuous line, radiating out from the parent plant.

Scanning electron photographs of the leaf indumentum of the type (MEL 50294) and Kenneally (11356) show similar indumentum (Figure 7).

S. merrallii appears restricted to the aprons of granite rocks. These outcrops provide excellent run-off during the winter and the surrounding rock holes contain water well into the summer. We know that Edwin Merrall was a prospector and that at the turn of the Century the roads to the Goldfields were *via* granite outcrops where water and grazing for horses could be obtained (B. Smith – pers. comm.). Camping at these outcrops would have given Merrall the opportunity to collect.

Plants of *S. merrallii* collected from Yanneymooring Hill have been found to be infected with the rust fungus *Puccinia stylidii* McAlpine. This is only the second host record for the State (R. Shivas – pers. comm.).

ACKNOWLEDGEMENTS

We wish to thank Basil and Mary Smith of Wongan Hills for their continuing enthusiasm and dedication to Western Australian botany and for providing the first flowering material of *S. merrallii* since the type collection. We also thank Dr S. James, Department of Botany, University of Western Australia for providing the chromosome count and Dr John Kuo, Electron Microscopy Centre, University of Western Australia, for the SEM photographs. Dr Jim Ross, Director, National Herbarium of Victoria, kindly expedited the loan of the type of *S. merrallii*. We gratefully acknowledge the assistance of Daphne Choules Edinger, Heather Exeter and Phillip Spencer. Mr D.G. Stockins, Registrar General, Registrar General's

Office, is thanked for supplying an office copy of the death registration of Edwin Merrall. We thank Mr Paul G. Wilson for his nomenclatural and taxonomic advice. Dr R. Shivas, W.A. Department of Agriculture identified the rust fungus.

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